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CLAIMS

- 1 1. An RFID tag antenna system suitable for receiving an RF signal, the RFID tag antenna system comprising:
 - 3 a planar two arm spiral structure arranged to receive the RF signal, the two arms electrically isolated from each other but arranged defining a gap between the two arms,
 - 4 an electronic circuit electrically connected to the arms straddling the gap and ar- ranged to receive the RF signal from the planar two arm spiral antenna, and
 - 5 means for sensing the receipt of the RF signal by the electronic circuit.
- 1 2. The RFID tag antenna system of claim 1 wherein the each arm of the pla-
2 nar two arm spiral structure is identical to the other except one is rotated the plane by 180
3 degrees from the other.
- 1 3. The RFID tag antenna system of claim 1 wherein a center is defined at the middle
2 of the gap, and wherein each arm of the planar two spiral structure defines an inner ra-
3 dial spiral and an outer radial spiral arranged so that the width of each arm grows as the
4 arms radiate farther from the center.
- 1 4. The RFID tag antenna system of claim 3 wherein the inner and outer radial spirals
2 adhere to a logarithmic function.
- 1 5. The RFID tag antenna system as defined in claim 3 wherein at any point equidis-
2 tant from the center the widths of each arm are equal to each other and equal to the spaces
3 between each arm.
- 1 6. The RFID tag antenna system of claim 1 wherein a lateral dimensions of the pla-
2 nar two spiral arm structure are less than about five inches by less than about two inches.

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1 7. The RFID tag antenna system of claim 1 wherein a lateral dimensions of the planar two spiral arm structure are less than about two inches by less than about one inches.

1 8. The RFID tag antenna system of claim 1 wherein each arm of the planar two arm spiral structure comprises a thin conductive layer built onto a substrate.

1 9. The RFID tag antenna system of claim 1 wherein the electronic circuit comprises:
2 a network that matches the spiral antenna electrical impedance and that receives
3 the RF signal from the planar two arm spiral antenna and provides an RF output signal,
4 and
5 an input circuit that receives and rectifies the output RF signal forming a DC signal.
6 the input circuit including a capacitor the stores energy from the DC signal.

1 10. The RFID tag antenna system of claim 9 wherein each arm of the planar two arm spiral structure comprises a thin conductive layer built onto a substrate, and further
3 wherein the matching and the input circuit is built onto the substrate.

1 11. The RFID tag antenna system of claim 10 further comprising a second substrate is
2 mounted to the first substrate where the input circuitry built onto the second substrate and
3 electrical connections are made from the matching network and the input circuit.

1 12. A method for receiving an RF signal from an RF signal generated as part of an
2 RFID tag system, the method comprising the steps of:
3 arranging a planar two arm spiral structure to receive the RF signal,
4 defining a gap between the two electrically isolated arms,
5 electrically connecting an electronic circuit straddling the gap and arranged to re-
6 ceive the RF signal from the planar two arm spiral antenna, and
7 sensing the receipt of the RF signal by the electronic circuit.

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- 1 13. The method of claim 12 further comprising the steps of:
 - 2 forming each arm of the planar two arm spiral structure identically to the other
 - 3 except, and
 - 4 rotating one arm in the plane by 180 degrees from the other.
- 1 14. The method of claim 12 further comprising the steps of:
 - 2 defining a center at the middle of the gap, and
 - 3 forming each arm of the planar two spiral structure with an inner radial spiral and
 - 4 an outer radial spiral, and
 - 5 arranging the width of each arm to grow as the arms radiate farther from the cen-
 - 6 ter.
- 1 15. The method of claim 14 wherein the step of forming each arm comprises the step
2 of using a logarithmic function to form inner and outer radial spirals.
- 1 16. The method of claim 14 further comprising the step of forming each arm such that
2 at any point equidistant from the center the widths of each arm are equal to each other
3 and equal to the spaces between each arm.
- 1 17. The method of claim 12 further comprising the step of forming a lateral dimen-
2 sions of the planar two spiral arm structure that are less than about five inches by less
3 than about two inches.
- 1 18. The method of claim 12 further comprising the step of forming a lateral dimen-
2 sions of the planar two spiral arm structure that are less than about two inches by less
3 than about one inches.
- 1 19. The method of claim 12 further comprising the step of forming each arm of the
2 planar two arm spiral structure with a thin conductive layer built onto a substrate.

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- 1 20. The method of claim 12 further comprising the steps of:
 - 2 providing a network that matches the spiral antenna electrical impedance and that
 - 3 receives the RF signal from the planar two arm spiral antenna and provides an RF output
 - 4 signal, and
 - 5 providing an input circuit that receives and rectifies the RF output signal forming
 - 6 a DC signal, the input circuit including a capacitor that stores energy from the DC signal.

- 1 21. The method claim 20 further comprising the steps of:
 - 2 building each arm of the planar two arm spiral structure with a thin conductive
 - 3 layer built onto a substrate, and
 - 4 building the network and the input circuit onto the substrate.

- 1 22. The method claim 21 further comprising the steps of:
 - 2 mounting the input circuitry built onto a second substrate, and
 - 3 making electrical connections from the matching network to the input circuit.